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**Rehabilitation Programs for Adult Offenders:
A Meta-Analysis in Support of Guidelines for Effective Practice**

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Summary Overview

Project Purpose

- To conduct a comprehensive meta-analysis of the available research through 2014 on the effects of intervention programs for adult offenders, building on an existing database drawn from eligible studies reported through 2005.
- To analyze the resulting meta-analytic data with a focus on estimating the impact of different interventions on recidivism and other outcomes, and identifying the program and participant characteristics most strongly associated with positive outcomes.
- To use the meta-analysis findings to construct effective practice guidelines and obtain feedback on their applicability, utility, and ease of implementation from criminal justice practitioners in the adult correctional system.

Project Design and Methods

Eligibility criteria. Research studies were eligible for inclusion in this meta-analysis if they met specific criteria summarized in brief as follows:

1. The study involves a qualifying psychosocial intervention or treatment that has as its aim, implicitly or explicitly, the reduction of criminal behavior or other improvements in behavior, skills, mental health, social functioning, and the like.
2. At least 50% of the sample consists of criminal offenders and at least 60% of the sample consists of adults (age ≥ 18 years) or the mean age of the sample is > 18 .
3. Outcomes for at least one participant group of at least 10 individuals receiving treatment are compared with those for at least one qualifying control condition (no treatment; treatment as usual, etc., but not persons dropping out or refusing treatment) of at least 10 individuals.
4. Participants are randomly assigned to treatment and control conditions, or matched on or

compared on baseline variables that included at least one pretest criminal history/risk variable or two relevant personal / demographic characteristics.

5. At least one outcome variable is reported for recidivism or other outcomes indicative of successful intervention such as employment, mental health, substance use, etc.
6. The study was conducted during or after 1950 in the U.S. or another English-speaking, culturally similar country (e.g., Canada, UK, Australia, New Zealand).

Literature Search and Screening. Electronic bibliographic databases including PsycInfo, NCJRS, Web of Science, JSTOR, ProQuest Dissertations and Theses, and Sociological Abstracts were searched using search terms tailored to each database. In addition, hand searches were conducted in the major criminal justice journals known to publish intervention studies or research reviews of intervention studies. The bibliographies of relevant review articles and prior meta-analyses found during the electronic and hand searches were also searched as were the reference lists in all eligible or near-eligible studies found. From all sources, more than 20,000 bibliographic entries for potentially eligible studies were identified and screened by trained research assistants. Abstracts and, when necessary, full text copies of the candidate studies were reviewed against the eligibility criteria, dropped if clearly ineligible, and placed in the coding queue otherwise, where final eligibility was determined during the coding process.

Coding. The coding team consisted of masters and doctoral graduate students whose training by experienced coders included practice coding with feedback. All studies were independently coded by two coders who then compared, discussed, and reconciled any differences to enhance the accuracy of the coding, with assistance from the project directors when needed.

Statistical Analysis. Standardized mean difference effect sizes were calculated for each eligible outcome for which sufficient data were reported in the source study and coded so that

positive values were favorable to treatment (e.g., less recidivism, more employment, etc.).

Inverse variance weights were also computed for each effect size based on sample sizes for the treatment and control groups. All analyses were conducted with the inverse variance weights incorporated and additional method-of-moments estimates of the between studies effect size variance included in random effects models. Outlier effect sizes were recoded to less extreme values of -1.00 and +1.30 to prevent them from exercising undue influence in the analysis.

Similarly, outlier inverse variance weights were recoded to 2000 for the same purpose.

Data Analysis and Findings

A total of 678 research reports contributed to the final database with many of those providing data on multiple independent treatment-control samples (e.g., for different sites) that were coded as separate studies. With those, the final database included a total of 801 eligible coded studies that provided at least one effect size on an eligible outcome variable. Table 1 summarizes the general characteristics of those 801 studies.

Table 1. Descriptive Characteristics of the Studies in the Final Database

Characteristic	Number of Studies	Percent
Type of publication		
Journal article	322	40.2
Book, book chapter	50	6.2
Technical report	246	30.7
Dissertation, thesis	170	21.2
Other	13	1.6
Year of publication		
1956-69	23	2.9
1970-79	127	15.9
1980-89	93	11.6
1990-99	186	23.2
2000-09	291	36.3
2010-14	81	10.1
Country		
USA	652	81.4
Canada	62	7.7
UK	61	7.6
Australia, New Zealand	26	3.2

(Table 1 continued on next page)

(Table 1 continued)

Characteristic	Number of Studies	Percent
Gender mix in sample		
No males (>95% female)	69	8.6
Some males (<50%)	8	1.0
Some males, cannot estimate	84	10.5
Mostly males (\geq 50%)	247	30.8
All males (>95%)	393	49.1
Mean age of sample		
18.0 to 19.9	39	4.9
20.0 to 29.9	249	31.1
30.0 to 39.9	371	46.3
40.0 to 49.9	22	2.7
50 or older	1	0.1
Cannot tell	119	14.9
Predominant race/ethnicity (>60%)		
Anglo	212	26.5
Black	116	14.5
Hispanic	7	0.9
Native American	10	1.2
Other minority	10	1.2
Mixed, none >60% or cannot estimate	435	54.3
Research design		
Randomized	282	35.2
Matched	264	33.0
Baseline comparison	240	30.0
Other and cannot tell	15	1.9
Primary intervention type		
CBT, CBT like	113	14.1
Group work, structured, psychoeducational	118	14.7
Counseling, mentoring	61	7.6
Work, vocational training	90	11.2
Academic	24	3.0
Supportive residential, e.g., therapeutic community, halfway house	116	14.5
Drug court, other specialized courts	53	6.6
Intensive supervision	34	4.2
Multimodal; mixed	104	13.0
Restorative, mediation, community service	20	2.5
Other	68	8.5
Criminal justice supervision/setting		
Probation	173	21.6
Correctional institution	388	48.4
Parole/aftercare	156	19.5
Not under CJ supervision, e.g., diversion	60	7.5
Other and cannot tell	24	3.0

(Table 1 continued on next page)

(Table 1 continued)

Characteristic	Number of Studies	Percent
Studies with outcomes in selected categories ^a		
Recidivism	634	79.2
Substance use	94	11.7
Employment	78	9.7
Mental health indicators	58	7.2
Anger/hostility	39	4.9
Aggression/violence (not reoffense type)	22	2.7

^a Studies can contribute effect sizes in more than one outcome category, so the number of studies across the categories is not expected to add to 801.

Mean Effect Sizes. As the last rows of Table 1 report, a large proportion of the 801 studies in the final database provided effect sizes for recidivism outcomes. Table 1 also shows the smaller proportions of studies that provided effect sizes for such other important outcomes for adult offenders as substance use, employment, and mental health symptoms. Because the mental health outcomes mainly relate to internalizing symptoms (anxiety, depression), Table 1 also shows outcomes for externalizing behavior (anger/hostility and aggression/violence) measured separately from any criminal behavior represented in the recidivism measures. Miscellaneous other outcome variables also appeared in these studies in small proportions that are not shown in Table 1 or summarized here (e.g., self-esteem, locus of control).

Some studies reported outcomes for more than one variable in a given construct category (e.g., recidivism for different types of offenses or for different levels of penetration in the CJ system, such as arrests, convictions, and incarceration). To eliminate statistical dependencies among effect sizes from the same participant samples, effect sizes in different construct categories were analyzed separately and, within a construct category, only one effect size was included in any analysis. The latter were selected to represent the broadest indicator of the respective construct (e.g., recidivism for all offenses, employment over the entire post-intervention period, etc.) and, in the case of recidivism, the outcome closest to the point of the

offending behavior (e.g., arrest rate in preference to conviction rate, conviction rate in preference to incarceration rate). When these criteria did not produce a resolution, the respective effect sizes were averaged into a composite value.

Table 2 reports the random effects inverse-variance weighted mean effect sizes for each of the outcome categories shown in Table 1 along with key associated statistics.

Table 2. Mean Effect Sizes for the Primary Outcome Categories

Outcome Category	Mean Effect Size (SE)^a	p-value for the Mean	Q(df)^b	p-value for Q
Recidivism	.203 (.013)	<.001	8719 (633)	<.001
Substance use	.197 (.037)	<.001	745 (93)	<.001
Employment	.252 (.033)	<.001	612 (77)	<.001
Mental health	.216 (.055)	<.001	210 (57)	<.001
Anger/hostility	.188 (.059)	.002	108 (38)	<.001
Aggression/violence	.174 (.082)	.034	140 (21)	<.001

^a SE= standard error of the mean. ^b The Q statistic is an index of the heterogeneity of the effect sizes, tested as Chi-square with the indicated degrees of freedom (df). The df value also happens to be the null value when there is no heterogeneity around the mean and thus is a benchmark for the amount of heterogeneity indicated by the Q value.

As Table 2 reports, the mean effect sizes for all these outcome categories are positive and statistically significant. At the same time, the Q-tests of the heterogeneity of the effect sizes around those means are also statistically significant and the magnitude of the Q values indicates that the amount of heterogeneity is substantial in all cases.

Exploration of Factors Associated with Variation in Recidivism Effects. Recidivism outcomes are, unsurprisingly, those most numerous in the studies contributing to this meta-analysis and also the most central in a criminal justice context for assessing the effects of the various interventions represented. A series of random effects inverse-variance weighted meta-regressions was conducted to explore potential predictors of the magnitude of the recidivism effect sizes with a focus on determining the factors most strongly associated with positive outcomes. The candidate predictors included variables in the following categories:

- Control variables potentially needed to adjust effect sizes for bias: Whether reoffending was indexed by arrests, convictions, or incarceration; the research design (randomized, matched, baseline comparisons only); whether baseline difference favored the treatment or control group; the time span included in the recidivism period; and whether there were statistical adjustments represented in the effect size, e.g., with covariates. The only one of these variables to show a consequential relationship with the recidivism effect sizes was the research design; all the other potential control variables were dropped from the final analysis.
- Variables related to the general context of the study: Whether conducted in the U.S. (which was not related to the effect sizes and was dropped from further analysis) and the criminal justice setting or supervision level (probation, correctional institution, parole, etc.).
- Characteristic of the participant sample: Gender mix; predominant race/ethnicity; and the main type of prior offense (general, drug, person, property, etc.). Mean age was also of interest but too many cases were missing data to include it in the analyses.
- Characteristics of the intervention: Whether delivered by the evaluator; routine practice vs. research/demonstration program; whether the provider was a CJ employee; new vs. established program; and the broad program approach (CBT, structured group, counseling, etc.; see Table 1). The routine practice-research/demonstration and CJ provider variables were not found to be related to effect sizes and were dropped from the final analysis.

An initial meta-regression model used all the available variables in these various categories as predictors of the recidivism effect sizes. Those that proved to be redundant with others in the analysis model or showed little independent predictive ability beyond that provided by other variables in the model were successively dropped from the analysis. Others judged to be of interest despite a weak performance were retained to make their role explicit. Table 3 shows the

final meta-regression model that resulted from this process.

Table 3. Meta-regression with Selected Candidate Predictors of Recidivism Effect Sizes

Predictor	Unstandardized Coefficient (SE)^a	p-value	Standardized Coefficient
Constant	.2206 (.134)	.100	.0000
Design (1=random, 2=matched, 3=baseline comparison)	.0546 (.018)**	.002	.1179
CJ supervision/setting			
Probation, community	.0578 (.047)	.217	.0614
Probation, partially/fully residential, e.g., day treatment	-.0948 (.067)	.155	-.0669
Correctional institution	-.0139 (.048)	.769	-.0174
Alternative custodial facility, e.g., camp, separate ward, psychiatric hospital	-.0250 (.053)	.635	-.0260
Parole, regular	.1454 (.065)**	.026	.0959
Aftercare, residential; e.g., halfway house	-.0340 (.070)	.624	-.0216
No CJ supervision, e.g., via diversion	-.0391 (.059)	.505	-.0310
Gender mix of participants (1 ≥ 95% female to 5 ≥ 95% male; mixed in between)	-.0214 (.013)*	.092	-.0620
Predominant race of participants (1=mostly Anglo, 2=mixed, 3=mostly minority)	-.0032 (.019)	.867	-.0060
Predominant type of prior offense(s)			
General or type unspecified	-.0420 (.069)	.545	-.0582
Violent offenses (other than domestic)	.0208 (.082)	.801	.0150
Domestic violence	.0399 (.098)	.683	.0202
Drug offenses	-.0141 (.073)	.846	-.0173
Property crimes	-.1301 (.075)*	.084	-.1246
Sex offenses	.1166 (.084)	.164	.0782
Role of evaluator in intervention (1 delivered treatment to 4 independent)	-.0449 (.018)**	.010	-.0989
Program age (1 <1 year, 2=1-2 years, 3 ≥ 2 years)	.0335 (.015)**	.029	.0837
General type of treatment			
CBT/CBT-like; thinking skills; relapse prevention; anger management	.1247 (.061)**	.040	.1112
Group work; structured via protocol or psychoeducational content	.1970 (.062)**	.002	.1548
Counseling; group, individual, mixed; mentoring	.1444 (.067)**	.030	.1029
Work-related; work release, job placement, vocational training	.0565 (.058)	.331	.0539
Academic; e.g., GED, college classes	.1256 (.086)	.145	.0611
Supportive residential; e.g., therapeutic community, halfway house	.0062 (.059)	.916	.0066
Drug court (mostly); other specialized court, e.g. mental health	.1607 (.070)**	.021	.1236
Intensive supervision; reduced probation or parole caseload	.0034 (.073)	.963	.0021
Multimodal, mixed treatments; individual case management	.0561 (.057)	.321	.0573
Restorative interventions; mediation, reparations, community service, victim-offender conferencing	.0505 (.090)	.575	.0233

^a SE= standard error. * $p < .10$, ** $p < .05$

The results in Table 3 show, first, that all else equal the recidivism effect sizes were larger with weaker designs and smaller with larger proportions of males in the participant samples. The sets of variables for CJ supervision/setting, predominant prior offense, and general type of treatment each accounted for significant effect size variance, though only scattered individual variables were significant. For CJ supervision/setting, the coefficients show better than average recidivism effects for regular probation and parole (however, individually significant only for parole) and below average effects for the alternatives. The pattern for prior offenses was larger than average effects for offenders with violent, domestic violence, and sex offense priors and below average effects for general offense, drug, and property crime priors. Among the treatment types, all showed above average effects relative to the reference group of all other treatments, though by trivial margins for supportive residential and intensive supervision programs. CBT-based approaches, structured group interventions, counseling, and drug courts stood out with individually positive, statistically significant effects.

Implications for Criminal Justice Policy and Practice

The overall positive mean effects found for recidivism and other outcomes demonstrate that distinct interventions with a rehabilitative orientation are generally beneficial for offenders in the criminal justice system beyond the practice as usual conditions with which they are generally compared in these studies. Practice as usual in criminal justice typically includes programming aimed at reducing recidivism, so the implication of the positive effects reported here is that further improvement is possible with additional focused intervention. Nor is the overall average magnitude of that additional improvement trivial in practical terms. With recidivism baserates for adult offenders often 50% or greater, effect sizes in the .20 range as found here represent about a 20% reduction in the recidivism rate. This finding is consistent with prior meta-analyses,

though the scope of the current work provides especially convincing support.

A primary objective of this project is to identify participant and program factors strongly enough related to recidivism effects (and possibly other outcomes) to provide the basis for practice guidelines for interventions with adult offenders. Several findings from the analyses reported here provide a step in that direction. For example, the greater benefits of programming while offenders are in the community under probation or parole supervision relative to treatment provided in residential facilities guides attention to the importance of community-based support. Further, among the broad intervention approaches, cognitive-behavioral, structured group, counseling, and drug court programs stand out as especially effective. The stronger effects found when the evaluator was more involved in service delivery and for more mature programs are also notable. These variables are most likely proxies for higher quality program implementation.

These overview analyses, however, only mine the surface. Further exploration of this rich database is underway to identify specific features of the more effective generic intervention approaches that further differentiate effects. This exploration is being pursued with meta-regression analyses using predictor variables representing more detail than the most general ones that are reported here, for example the influence of different service providers in different contexts (e.g., criminal justice vs. mental health providers in prison contexts), the duration of the treatment programs, differential effects for different subpopulations (e.g., females, sex offenders), and the like. Such findings will provide additional input for the ultimate goal of this project—developing useful guidelines for effective intervention with adult offenders that can be readily used by criminal justice practitioners.